

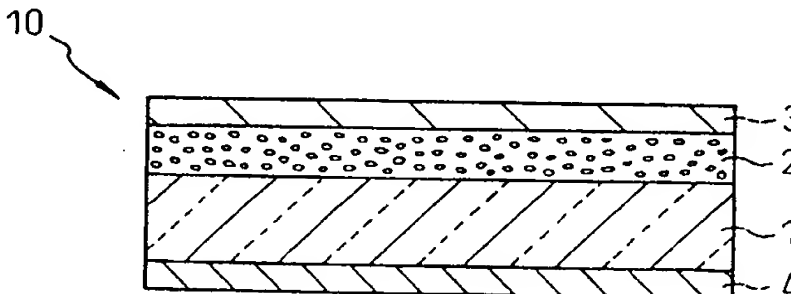
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C03C 17/00		A1	(11) International Publication Number: WO 00/53537
			(43) International Publication Date: 14 September 2000 (14.09.00)
(21) International Application Number: PCT/US00/04759 (22) International Filing Date: 25 February 2000 (25.02.00) (30) Priority Data: 11/63463 10 March 1999 (10.03.99) JP (71) Applicant (for all designated States except US): MINNESOTA MINING AND MANUFACTURING COMPANY [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): MIZUMOTO, Yoichiro [JP/JP]; 547-215, Futatsubashi-cho, Seya-ku, Yokohoma-cit, Kanagawa pref. 246 (JP). (74) Agents: KNECHT, Harold, C., III et al.; Office of Intellectual Property Counsel, P.O. Box 33427, Saint Paul, MN 55133-3427 (US).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: DECORATIVE FILMS FOR GLASS-PANED WINDOW

(57) Abstract

A decorative film for glass-paned window, which is superior in privacy protection, light screening property and decorative effect. The decorative film comprises a transparent substrate and a colored layer comprising ink containing an optical coherent pigment. The colored layer is provided on one surface of the substrate.



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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 54834PCT1A	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 06/ 04759	International filing date (day/month/year) 25/02/2000	(Earliest) Priority Date (day/month/year) 10/03/1999
Applicant MINNESOTA MINING AND MANUFACTURING COMPANY et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

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None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/04759

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C03C17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C03C B44F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ✓	EP 0 578 829 A (FIGLA CO LTD ; SHISEIDO CO LTD (JP)) 19 January 1994 (1994-01-19) the whole document	1-16
A ✓	EP 0 298 603 A (MEARL CORP) 11 January 1989 (1989-01-11) claims 1-4	1-6
A ✓	DATABASE WPI Section Ch, Week 199131 Derwent Publications Ltd., London, GB; Class G02, AN 1991-225746 XP002141665 & JP 03 143575 A (KANSAI PAINT CO LTD), 19 June 1991 (1991-06-19) abstract	1-16

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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

3 July 2000

Date of mailing of the international search report

13/07/2000

Name and mailing address of the ISA

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Authorized officer

Reedijk, A

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/04759

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PATENT ABSTRACTS OF JAPAN vol. 015, no. 228 (M-1123), 11 June 1991 (1991-06-11) & JP 03 069397 A (DAINIPPON PRINTING CO LTD), 25 March 1991 (1991-03-25) cited in the application abstract</p>	1-16
A	<p>US 5 034 084 A (SCHAEFER WERNER ET AL) 23 July 1991 (1991-07-23) claims 1-5</p>	1-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/04759

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0578829	A	19-01-1994	WO 9313939 A US 5605751 A	22-07-1993 25-02-1997
EP 0298603	A	11-01-1989	US 4797308 A AT 92851 T DE 3883097 A DE 3883097 T ES 2043821 T	10-01-1989 15-08-1993 16-09-1993 02-12-1993 01-01-1994
JP 3143575	A	19-06-1991	NONE	
JP 03069397	A	25-03-1991	NONE	
US 5034084	A	23-07-1991	EP 0357808 A	14-03-1990

REPLACED BY
ART 34 AMBT

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

161

Applicant's or agent's file reference Hi-bu 002224wo	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US00/04759	International filing date (day/month/year) 25/02/2000	Priority date (day/month/year) 10/03/1999
International Patent Classification (IPC) or national classification and IPC C03C17/00		
Applicant MINNESOTA MINING AND MANUFACTURING COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 16/09/2000	Date of completion of this report 13.06.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Krafka, B Telephone No. +49 89 2399 8140 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/04759

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-8 as originally filed

Claims, No.:

1-15 with telefax of 28/05/2001

Drawings, sheets:

1/2,2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US00/04759

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-15
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-15
Industrial applicability (IA)	Yes: Claims 1-15
	No: Claims

2. Citations and explanations
see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) Reference is made to the following documents:

D1: EP-A-0 578 829

D2: EP-A-0 298 603

D3: DATABASE WPI Section Ch, Week 199131 Derwent Publications Ltd., London, GB; Class G02, AN 1991-225746 XP002141665 & JP 03 143575 A (KANSAI PAINT CO LTD), 19 June 1991 (1991-06-19)

2) Novelty - Art. 33 (1) and (2) PCT

- 2.1. D1 discloses a decorative laminate on light-transmissive bases such as a glass sheet (p. 3 l. 11-16) comprising a coloured layer of water paint with optical coherent pigments (Improvement Ex. 3, Example of Invention 1, p. 3 l. 39-45). The coloured layer is provided on one side of the substrate (Fig. 1). As a colouring pigment, flake-like mica grain covered on the surface with titanium dioxide is used (p. 3 l. 5- 7). The thickness of said laminate is 1 mm in Example 1. Therefore, the subject-matter of claims 1-15 is considered to be novel in the light of D1.
- 2.2. D2 discloses a decorative film comprising a pearlescent sheet comprising a transparent plastic pigmented with a titanium dioxide-coated or ferric oxide-coated mica (particle size e.g. 5-15 μm , Ex. 4, claims 1-3). The second layer is an iridescent film consisting of alternating layers of two or more transparent thermoplastic polymers. The lamination is achieved with an adhesive (p. 2 l. 35-49). The outermost layer does not contribute to the optical effect and serves to impart desirable mechanical and other properties (p. 4 l. 3-11). The additional layers may be provided on each of the two outer surfaces. The surface is very receptive to adhesives as well as to printing inks (p. 5 l. 52-55). The film can be laminated together with for instance clear and colourless polyurethane adhesive (p. 5 l. 57-58). However, the individual layers of the film are very thin, usually in the range of about 30 to 500 nm (p. 3 l. 48-49). Therefore, the subject-matter of claims 1-15 is considered to be novel also in the light of D2.

3) Inventive Step - Art. 33 (1) and (3) PCT

- 3.1. The technical problem underlying the present invention can be seen in providing a decorative film suitable for glass-pane windows. This problem is overcome by the present invention by a decorative film that comprises a transparent substrate and a coloured layer, where the coloured layer comprises ink containing an optical coherent pigment. The coloured layer is provided on one surface of the substrate. Document D1 is considered to represent the closest prior art.
- 3.2. Both D1 and D2 disclose a decorative film as defined in claim 1, and D3 relates to a coat comprising a coloured layer, a base layer and a clear layer on a substrate. The prior art films are not transparent. However, transparency to visible light does not represent an essential feature of the invention as defined in the claims of the present application. Therefore, although it appears from the paragraph on p. 1 l. 11-26 of the description that the subjective decorative film is meant to meet the visible light transmission requirements for automotive window applications, documents D1, D2 and D3 are regarded as representing the relevant background art for the present application.
- 3.3. In claim 1, a coloured layer thickness of 2 to 20 μm is defined. This thickness appears to be merely a selection from typical values as described in the prior art that would be simply one among a multitude of choices for a person skilled in the art intending to construct a coated glass pane like the one claimed by the present application (e.g. D1: 1 mm (Ex. 1), D2: 30 to 500 nm (p. 3 l. 48-49), D3: > 100 μm). Such a selection can only be regarded as inventive, if it presents unexpected effects or properties in relation to the rest of the range. However, no such effects or properties are indicated in the application. Hence, in the light of D1 no inventive step is present in the subject-matter of claims 1-3, 6-7 and 12-13 (see also 2.1), and in the light of D2 no inventive step is present in the subject-matter of claims 1-4 and 6-9 (see also 2.2).
- 3.4. D3 is also from the field of coloured paints provided on a base. The paint comprises titanium dioxide-coated mica platelets with a max. length of 5-60 μm , and the composition of the paint is vehicle component : mica pigment : coloured pigment in a weight ratio of 100 : 0.1-20 : 0.01-30. These features appear to

represent standard features of this kind of paints. Therefore, in combination with the technical features disclosed in either D1 or D2, the subject-matter of claim 5 is not considered to be inventive.

- 3.5. The features claimed in claims 10, 11 and 14 are considered to represent standard procedures for a person skilled in the art, therefore not apt to justify an inventive step. In particular regarding the decorative film of D1, which is meant to be applied to glass windows, it is regarded as obvious to apply such a film alternatively to a glass automobile window pane. Therefore, the subject-matter of claims 10, 11 and 14 is not regarded as inventive.
- 3.6. The features of claim 15 have all been disclosed in D2 (see 2.2) with the exception of a glass surface as substrate, as it is subject-matter of D1. D1 and D2 both belong to the technical field of pigmented decorative coloured layers applied to a substrate, therefore it is regarded as obvious to a person skilled in the art to combine the features of D1 and D2. Thus, an inventive step cannot be acknowledged for the subject-matter of claim 15.

CLAIMS

1. A decorative film for glass-paned window, comprising a transparent substrate and a colored layer comprising ink containing an optical coherent pigment, said colored layer being provided on one surface of said substrate.

2. The decorative film according to claim 1, wherein said ink is polarizing pearl ink.

3. The decorative film according to claim 2, wherein said polarizing pearl ink contains a pigment and said pigment is a scaly flake pigment.

4. The decorative film according to claim 3, wherein said flake has an average particle diameter in the range of from 5 to 130 μm .

5. The decorative film according to claim 4, wherein the content of said pigment in said polarizing pearl ink is in the range of from greater than 1% by weight to less than 40% by weight.

6. The decorative film according to claim 2, wherein said polarizing pearl ink contains a pigment and said pigment is at least one of a scaly titanium dioxide-coated mica flake and iron oxide-coated mica flake.

7. The decorative film according to claim 2, wherein said polarizing pearl ink contains pigment from the group consisting of a titanium dioxide-coated mica flake, iron oxide-coated mica flake and bismuth trichloride, a scaly glass flake and combinations thereof.

8. The decorative film according to claim 1, wherein a film thickness of said colored layer is in the range of from 1 to 20 μm .

9. The decorative film according to claim 1, further comprising a clear layer and an adhesive layer, wherein said colored layer and said clear layer are laminated, in order, on said one surface of said transparent substrate, and said adhesive layer is provided on another surface of said transparent substrate opposite said colored layer.

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10. The decorative film according to claim 1, further comprising a clear layer and an adhesive layer, wherein said colored layer, said clear layer and said adhesive layer are laminated, in order, on said one surface of said transparent substrate.

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11. The decorative film according to claim 1 in combination with a glass automobile window pane, said decorative film being bonded to a glass surface of said glass window pane.

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12. The combination according to claim 11, wherein said window pane is an automobile window pane.

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13. A method of decorating a glass surface comprising:
providing the decorative film according to claim 1; and
applying the decorative film to a glass surface.

14. The method according to claim 13, wherein the glass surface is the surface of a glass-paned window.

15. The method according to claim 13, wherein the glass surface is the surface of an automobile glass-paned window.

16. The method according to claim 13, wherein the decorative film being provided further comprises an adhesive layer on another surface of the transparent substrate opposite the colored layer, and said step of applying the decorative film includes bonding the decorative film to the glass surface using the adhesive layer.